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Title: BI-LAYER ETCH STOP FOR INTER-LEVEL VIA ;

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ABSTRACT:

An inter-level metallization structure and the method of forming it, preferably based on copper dual damascene in which the lower-metal level is formed with a exposed metallization (22) and an adjacent, embedded stop layer (50), both the metallization and embedded stop layer have exposed surfaces approximately level with each other with a lower dielectric layer (18). The upper-metal level includes a second stop layer (30) deposited over the embedded stop layer (50) and the first metallization (22) and a second dielectric layer (32). An inter-level via (40) is etched through the second dielectric layer (32) and through the second stop layer (30) and metal is filled into the via to contact the metallization (22). If the inter-level via (40) is offset over the edge of the metallization (22), the metal in the via (40) contacts the embedded stop layer (50) and not the first dielectric layer (18), whereby the embedded stop layer (50) acts as a copper diffusion barrier. The structure and method are particularly useful when the sidewalls of via hole are first coated with a second copper barrier layer but the via bottom is not so coated, thereby decreasing contact resistance and allowing copper diffusion in the absence of an in-line barrier.